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Measuring and Tracking Skills in the Army Reconnaissance Course

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14. ABSTRACT

This report describes follow-on research to Ratwani, Dean, Knott, Diedrich, Flanagan, Walker, and Tucker (2016) which developed an assessment toolkit for the Army Reconnaissance Course. The ARC-Field Tool (ARC-FT) includes measures of leader skills/attributes on a tablet allowing instructors to observe and assess classroom and field events in real time. The ARC-FT supports standardized training assessments and provides consistent, accurate ratings of attributes across students and instructors. Student data are stored and easily accessed to support instructor hand off or shift change within and across training days and can be exported to a server for aggregation and trend analysis over time. The ARC-FT also supports course management activities by allowing students and instructors to sign summative assessments and by saving / printing the assessments to a final approved paper format. The first report (Ratwani et al., 2016) focuses on the initial development and evaluation of the tool. The current research report describes the development of additional performance measures, the associated performance assessment software, and the toolkit's subsequent use and evaluation. The results described in both reports point to good agreement across raters and demonstrated the usefulness of the tool for assessing and tracking student progress.

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Specifically, we thank CPT Josh Christian, CPT Steve Doyle, CPT Patrick Zang, SSG James Harpole, SSG Joshua Lawton, and SFC Keith Ayers as well as the many ARC instructors who served as proponents of this research.

INSTRUCTIONAL METHODS TOOL

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Measuring and Tracking Skills in the Army Reconnaissance Course

> *The nature of military operations requires responsibility and decision making at the point of action. Mission command demands leaders who can adapt their thinking, their formations, and their employment techniques to the specific situation they face. Mission command demands agile and adaptive reconnaissance and security organizations that can develop the situation through action in close contact with the enemy and civilian populace to set conditions for future success. (U.S. Department of the Army, FM 3-98, 2015)*

From its inception, one of the overarching outcomes associated with the Army Reconnaissance Course (ARC) was the purposeful development of desired leader attributes and skills through the teaching of reconnaissance fundamentals. This developmental goal was accomplished by the consummate support and guidance of Brigade, Battalion, and course leadership; an internal instructor training program; the setting of conditions for comprehensive curriculum development; and the development of an effective assessment strategy. The assessment strategy was developed to address not only technical and tactical outcomes of reconnaissance such as *demonstrate improved ability to assess terrain, friendly and enemy capability*, but also ARC identified leader attributes such as adaptability, anticipation, and problem solving. The ARC represents one example of seeking to develop the three components of the Human Dimension strategy – cognitive, physical, and social skills (Army Human Dimension Council, 2015) – and reinforces the desired attributes and competencies delineated within the Army's Leadership Requirements Model (U.S. Department of the Army, 2012).

The outcomes, course structure, and teaching approach of the ARC drove the need to more clearly define those hard-to-rate ambiguous *leader attributes* and skills and create assessments that are not only effective, but also consistent across cadre members. Conceptually defining adaptability is one thing; how it specifically manifests itself in observable behaviors in the context of the course is another. What one cadre member believes adaptability looks like within the ARC may be different from another. Thus, the focus of this research, in close collaboration with ARC leadership and cadre, was to define identified leader attributes and skills, develop measures of observable behaviors, and validate those measures to create a consistent and standardized assessment process. To accompany the measures, a tablet-based assessment tool was developed to digitize and streamline the process.

Initial pieces of this research are described in Ratwani, Dean, Knott, Diedrich, Flanagan, Walker, and Tucker (2016). That report primarily focuses on the development of leader attribute measures as well as initial tool development and validation. However, as the ARC continued to evolve, additional research and development also continued so as to meet the needs of the course. Thus, this report describes additional development and evaluation of the assessment toolkit developed for the ARC, including the development of the performance measures, the associated performance assessment software, and the toolkit's subsequent use and a brief description of the evaluation. Screenshots are contained throughout, and the User Guide is in Appendix A. This report first briefly summarizes the work detailed in Ratwani et al. and then describes further development and testing of the toolkit.

Summary of Initial Tool Development and Evaluation

The goals of the ARC are not solely to develop Soldiers who possess the tactical and technical reconnaissance skills, but also to develop a full range of leader attributes in students. Given this complexity, ARC cadre face several assessment challenges including the need to (a) make assessments continuously and consistently across various instructors and environments; (b) capture performance data quickly so as not to interfere with instruction; and (c) compile assessment data over time to allow for easy comparisons both within and between students (see Ratwani et al., 2016 for more details regarding the assessment environment).

Based on those assessment challenges, the first goal of the initial work was to develop performance measures that allowed instructors to rate students consistently and reliably on leader attributes. Input was collected from cadre over a series of three iterative workshops. The result of the workshop process was behavioral descriptions for each leader attribute on the same -2 to +2 scale currently in use by the ARC. See Figure 1 for an example. The performance measures contained within each scale were evaluated to ensure that all instructors were interpreting the descriptions and the overall leader attribute in the same manner. Additional details about the development of leader attribute measures and the associated evaluation are described in Ratwani et al. (2016).

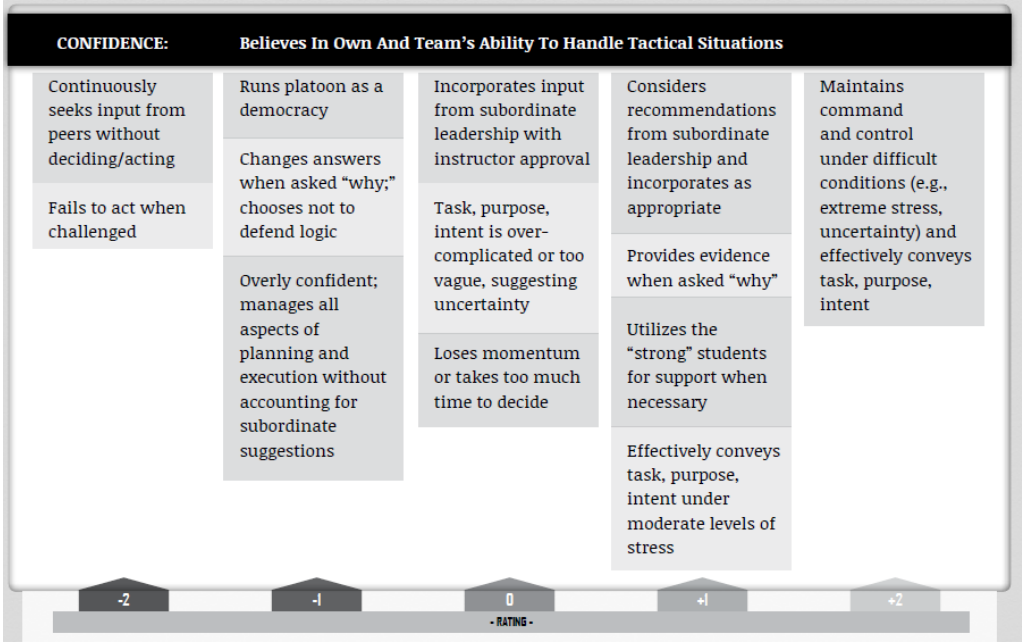

Figure 1. Example leader attribute measure.

In addition to performance measures, technology options for enabling more effective and efficient assessment were discussed with the cadre during those three workshops, ultimately leading to the development of the ARC-Field Tool (ARC-FT). This performance assessment tool was designed to provide mobile, digital data capture solutions with easy to use interfaces that reduced redundancies and overall workload. The ARC-FT represents a digitized version of both the common green notebook carried by instructors for formative assessment and the paper assessment form required for summative assessment of student achievement. To enhance both formative (e.g., during After Action Reviews) and summative assessments, the tool enables

instructors to record student behavior by taking photos and videos, typing in a note, or by using voice-to-text. Instructors can then attach those observations to assessments of anticipated outcomes and the leader attributes (as described above) in both classroom and field events. Ultimately, the ARC-FT enables ARC instructors to capture critical performance metrics for students that reflect learning and progression within the ARC; a simple trending interface within the mobile tool provides instructors with data on students over the duration of the course.

As described in Ratwani et al. (2016), two initial evaluations of the performance assessment tool were conducted. The first was a supported field test evaluation, and the second was an unsupported leave-behind. The primary goal of both evaluations was to assess the ability of the ARC-FT to support data collection and measurement during trainee assessment, and ultimately, to support Soldier development. Secondary to this goal was to identify additional requirements of the tool to enhance its effectiveness and make it more usable and useful for the cadre. The results of both the supported and unsupported evaluations were positive, and the usability of the tool was rated highly. However, the results did point to some additional requirements and desired functionality to further enhance its usefulness as a performance assessment tool.

Additional Development and Evaluation

Following the initial development of the ARC-FT, follow-on research and development was conducted to continue improving the tool and aligning it with the needs of the cadre. Consequently, a follow-up workshop with ARC leadership and representative cadre was conducted to develop a list of modifications. The workshop focused on the results of the initial evaluation, reviewing each existing feature and determining if it should remain, be removed, or modified. In addition, other desired features and functionalities were identified. Then, these "wish list" items were reviewed, and a shortened list of practical and feasible features was established. The workshop yielded a final plan for revision of the ARC-FT. The plan specified the elimination of several elements of the tool, including the observations function and the trend display. Participants agreed that both features were useful in theory, but impractical in the field. Specifically, the observations function created an extra step for instructors that, while providing critical information, could be better captured in other ways given the specific workflow of ARC. The trending tool, while useful for assessing Soldier development, was not necessarily needed in the field and may be best addressed outside of the mobile toolkit.

Both the deletion of those features as well as the identification of the items on the wish list represent changes that could have only been recognized in the field; it was impossible to realize the usefulness of specific features until the tool was used by the cadre and a more realistic view of their workflow and intended use of the tool could be captured.

As the revisions began, the ARC cadre also began reexamining some of their assessment rubrics. Specifically, they revised the Expected Outcomes, adding behavioral examples for each performance measure in a format similar to the Leader Attributes above (see Figure 1). Thus, a new interface was developed to accommodate this change. Figure 2 illustrates this new interface. Under the revised approach, cadre are able to select the behaviors they are observing; based on the selections made, a recommended score on the -2 to +2 scale is made (e.g., if most behaviors

selected fall under the +1 category, the tool recommends that a +1 be given on that specific outcome). Instructors can override the recommendation when making a final assessment as desired. In addition to having the ability to rate students on both the Leader Attributes and the Expected Outcomes, ARC cadre expressed a desire to include a place for the Combined Arms Training Strategy (CATS) assessments within the tool. Thus, ARC-FT was revised to include assessment forms for the four CATS exercises part of the ARC (Conduct Area Reconnaissance (PLT-Company); Conduct Route Reconnaissance (PLT-Company); Conduct Zone Reconnaissance (PLT-Company); and Conduct a Screen (PLT-Company)). Each task is rated with a thumbs up/thumbs down icon. See Figure 3 for a screen shot of this portion of the assessment process.

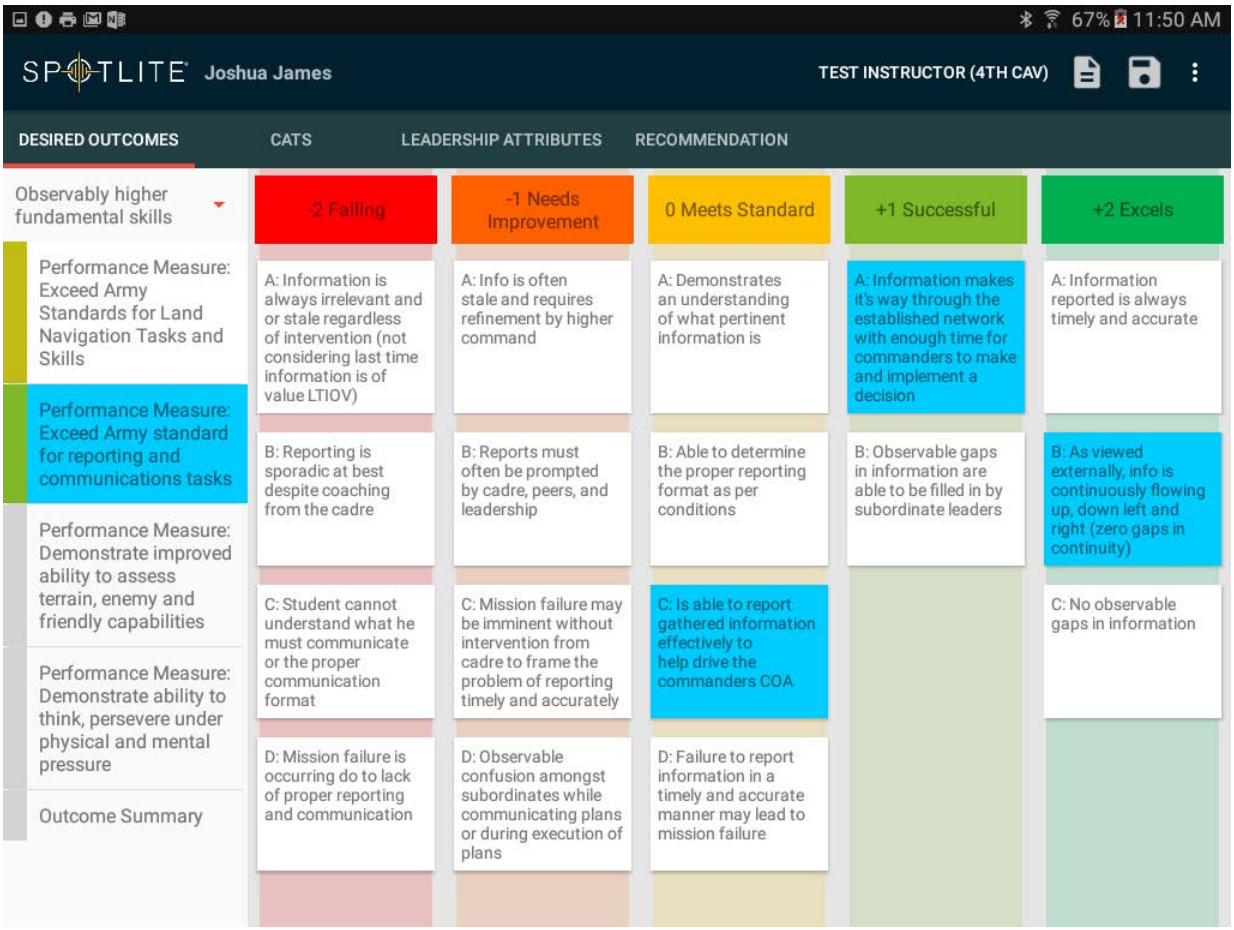

Figure 2. Revised ARC-FT assessment interface.

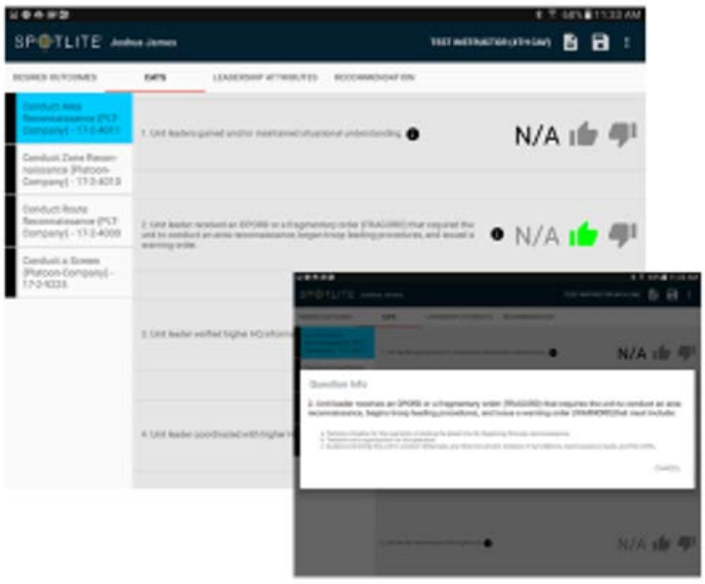

Figure 3. CATS ratings within the ARC-FT.

Finally, in addition to these more formal assessment mechanisms, ARC-FT contains the ability to create an on-the-spot assessment of Soldiers via a red and green card feature. At any point, cadre have the ability to access a red or green card within the tool. The cadre must enter a short note via keyboard, stylus, or voice dictation; the tool then allows the student to directly sign the assessment. Figure 4 displays a screen shot of this feature.

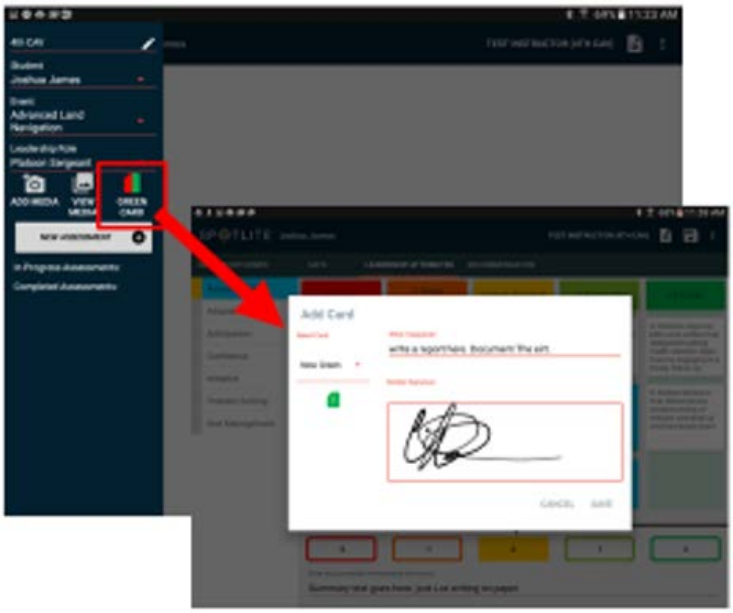

Figure 4. Red/green card feature for on-the-spot assessments.

Another key feature that was added to the revised ARC-FT was a peer-to-peer exchange. Cadre leading field exercises work a 12-hour shift, but the exercise may run continuously for 2-4 days, necessitating that shift changes occur in the field. During shift changes, relieving cadre are briefed on the students' performance and the departing instructor's assessments (ongoing, or completed). This exchange can be augmented by a digital exchange of completed and partially completed assessments, as well as any useful media captured (photos, videos). The incoming instructor can receive these data and resume any ongoing assessments during the next shift.

The final major new development was a formatting and print function. This added feature enables cadre to print their completed assessments directly from their mobile device. This feature eliminated the need for electronic transfer of data to a PC laptop, saving time and reducing the number of pieces of hardware in the overall system.

Following development of the revised field tool, another evaluation was conducted that was a hybrid of the prior two approaches. The tool was furnished to every instructor for the duration of the course cycle. Researchers were present for two of the field events to provide support and gather feedback. Prior to the start of the cycle the research team provided brief training on the tool to account for changes in personnel and the changes to the tool. A pair from the research team met with cadre periodically during their first field exercise, gathering feedback and users' first impressions. A trio of researchers returned for the second to last field event to gather additional feedback and track users' changing impressions.

The revised tool was very well received. The concerns with the initial build were addressed, and users indicated their general satisfaction with the new version of the tool. Instructors did identify some new features (not previously identified) that they wished to see implemented (e.g., night vision mode, a summary of shared assessment data from the peer exchange). These were largely agreed upon to be enhancements that increase users' situation awareness and satisfaction but not necessary for implementation. Therefore, one additional internal review of the tool was conducted, and a final version of the ARC-FT was released to the cadre.

References

Army Human Dimension Council (2015). *The Army Human Dimension Strategy.* Retrieved 25 Aug 17: *http://usacac.army.mil/sites/default/files/publications/20150524_Human_Dimension_Strategy_vr_Signature_WM_1.pdf*

Ratwani, K. L., Dean, C. R., Knott, C., Diedrich, F., Flanagan, S., Walker, K., & Tucker, J. S. (2016). *Measuring Leader Attributes in the Army Reconnaissance Course.* (ARI Research Report 1993). Ft. Belvoir, VA: ARI.

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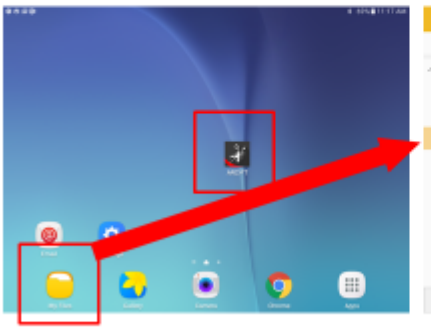
Appendix A

User Guide

Home Base

The Tablet's Home Screen



There is a folder for ARC-related materials

Primary Features

The ARC-FT features a slideout menu. It is from this menu that you should do most of your setup.

This menu contains Cav selection, student's names, event lists, leadership positions, commands for starting assessments, existing assessments, and completed assessments. It also features commands for green cards, and photos/videos.

To access the slideout menu, swipe your finger from the left edge of the tablet's screen towards the middle.

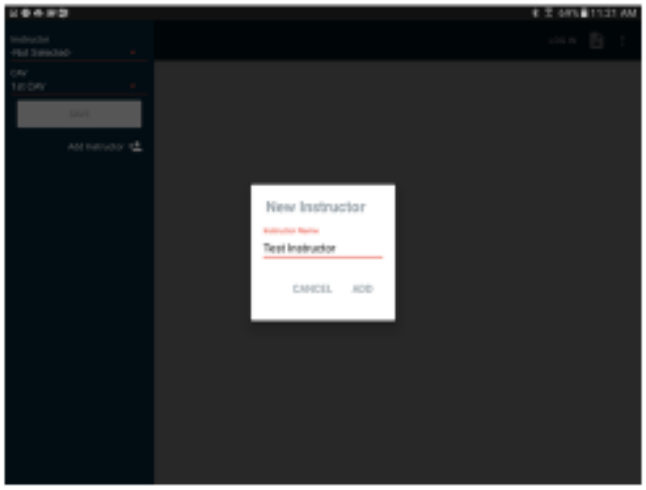
Getting Started

At the start, the app will not have any data. Thus, your first step is to create your user account.

1. Type in your name
2. Select your CAV
3. Hit SAVE

This should only happen once. Your account should remain.

If you need to share hardware, other instructors can create their accounts as well.



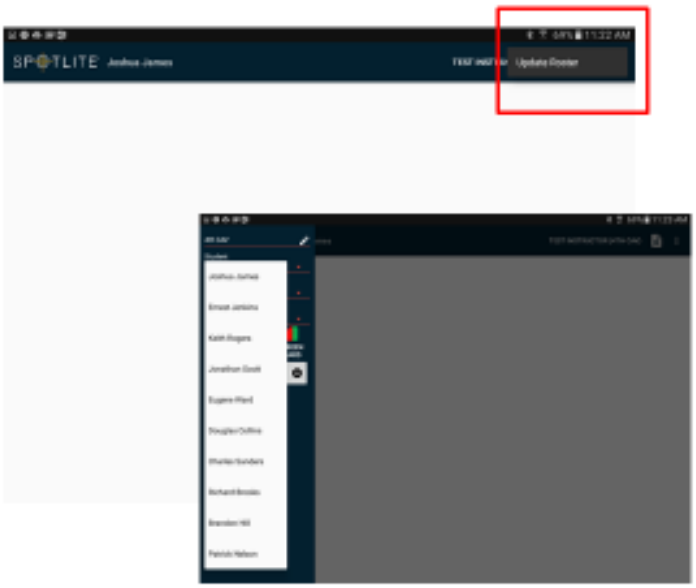
Load up a Roster

Hit the menu in top right (looks like three vertical dots): ⋮

You should have a .csv file on your tablet at Device Storage>ARC-FT>Roster

Note: this MUST be a .csv file.

You will have to repeat this step once for each cycle.



Select a Student to Rate

Tool should default to your Cav and to first student on the list for that Cav

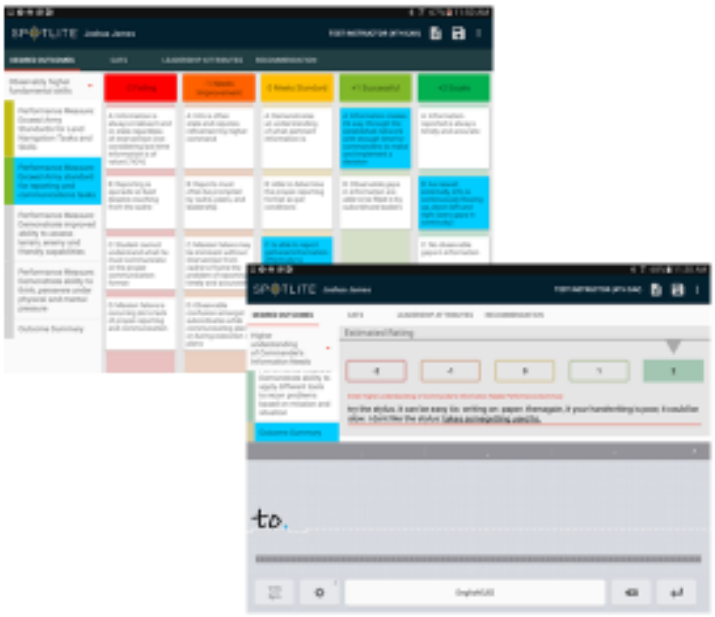
1. Choose a student from the dropdown list
2. Choose an Event
3. Choose a Leadership Position
4. Hit "New Assessment"

ARC Student Assessment Forms

There is a section for *Desired Outcomes*, *CATS*, and *Leadership Attributes*.

ARC-FT defaults to First Outcome/Attribute and to the first performance measure.

1. To start rating, tap on the box pertaining to the observed behavior
2. If necessary scroll to those boxes not visible
3. Press and swipe finger up
4. After marking all desired boxes, select the next Performance Measure
5. At the end of the assessment, select the overall rating and type, write, or dictate a summary.



CATS

All four CATS exercises are in the tool. Select the appropriate one for the student and fill out the form.

Go is represented by a thumbs up;
No-Go is represented by a thumbs down

N/A is there to skip tasks that are not performed for logistical reasons.

The information icon ⓘ provides the description of the task, consistent with your current CATS forms.

Leadership Attributes

The Leadership Attributes work the same way as Desired Outcomes:

1. Select whatever behaviors were demonstrated by the student
2. Select a rating at the end. Note the arrow points to the average. This is a suggestion; confirm or overrule this suggestion
3. Type, write, or dictate a summary.

Wrapping Up an Assessment

Your assessment is not finished until you write your recommendations.

A blank is available to write your recommendations. Type, write, or dictate.

Once finished, hit "Finished."

A warning will come up. Once finished, an assessment CANNOT be modified. It will go to print as is.

Printing Assessments

1. Make sure you are within range of your printer (same room is best)
2. Hit the menu button at the top right, and a Print command will appear
3. First you will see a print view of all of your assessments and Green Cards
4. Hit Print in the top right corner.
5. Again, you will see your document(s). Here, you can deselect anything you have already printed, or do not wish to print (little yellow checkmark in the bottom right corner of each page).
6. A printer icon will appear on the right.
7. Hit the printer icon and your document(s) will print.

Setting up a printer is easy. Instructions for printer setup are provided separately.

If you have several printers set up, you may need to select the appropriate printer from the top left menu.

Other Features: Green Cards

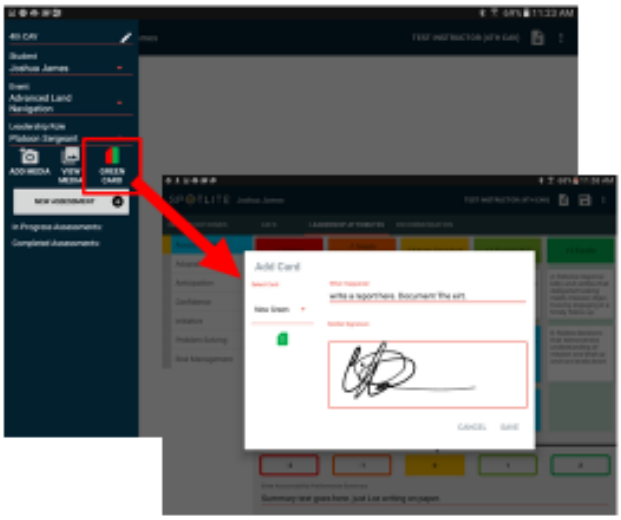
Green Cards can be completed on the tablet as well. You can access a green card at any time within the app (except for while printing).

The Green Card can be selected from the slideout menu for your current student.

All that is required for a green card is an explanation. Type, dictate, or write the narrative.

Have the student sign the green card with a stylus or finger.

If a red card is required, there is a selector to switch.



Sharing Assessments

The ARC-FT allows you to share data with other cadre. This feature is designed to support knowledge dumps at shift changes.

1. Turn on Bluetooth on both devices
2. The exiting instructor should select "Send Observations" from the top menu (three dots in top right)
    1. The app will search for other devices
    2. Select your cohort's device
3. The oncoming instructor should select "Receive Observations" from the same menu
    1. You may receive a permissions request. Hit Yes
4. The devices should do the rest
5. Any ongoing or completed assessments will be under the names of their relevant students

Multi-Media

Pictures and video can be taken to capture notable behaviors, routes, or planning products.

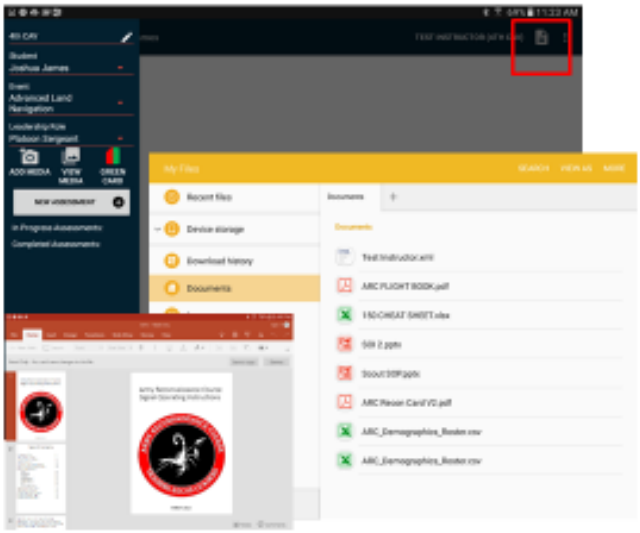
If you need a photo/video of one or more students, you can quickly get a capture and tag it to the student(s).

1. Pull the slideout menu
2. Select "Add Media"
3. Select photo or video
4. Capture the moment
5. Select from the list of names who is in the image.
    1. The list will already have your selected student checked. Uncheck if this student wasn't involved
    2. Check any other student names
    3. Note: this feature is limited to just the current selected Cav.

Pictures are stored in My Files>Device Storage>ARC-FT>Pictures

Instructor Documents

The ARC-FT has a place for you to store and access instructor materials; use this to lighten your load (drop that 3-ring binder from your rucksack).

There is an icon on the top right that will open a folder on your tablet. You can access different documents quickly if you need to reference them.

Adding new material to this folder can be done with a PC and a cable.